Notice of Allowability	Application No.	Applicant(s)	
	10/528,054	KONISHI ET AL.	
	Examiner	Art Unit	
	Ling-Siu Choi	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the Amendment filed 10/02/2007*.

2. ☒ The allowed claim(s) is/are *1-20*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. this Office Action is in response to the Amendment filed 10/02/2007. Claim 20 has been added and claims 1-20 are now pending.

Allowable Subject Matter

2. Claims 1-20 are allowed.

3. The following is an examiner's statement of reasons for allowance:

The present claims are allowable over the closest references: Jones et al. (US 4,767,823), Aystetten et al. (US 3,856,766), Rifi (US 4,593,075), and Benedikt et al. (US 4,473,451).

Summary of Claim 9:

A chlorinated polyolefin having	
	the elongation based on a tensile test is 1500% or greater
	the glass transition temperature is no higher than -25°C
wherein the chlorinated polyolefin is produced by a process comprising a step of melting and kneading a polyolefin and then molding it to obtain a solid a step of pulverizing the solid into powder having a mean particle size of no greater than 500 μm, and a step of chlorinating the powder	

Jones et al. disclose a process to chlorinate polyethylene having a weight-based median particle size of from about 120 to about 600 microns, wherein the chemically combined chlorine content is from 15 to about 28 wt% (abstract). Attention is drawn to Table VI, wherein the Samples 3, 4, and 5 have the chlorine content of 21.4, 23.7, and 26.2 wt% respectively and the heat of fusion of 1.13, 2.59, and 0.09 cal/g (1 J = 0.2390 cal) respectively. However, Jones et al. do not teach or fairly suggest the claimed process, wherein the process comprises a step of melting, kneading, and then molding a polyolefin to a solid, a step of pulverizing the solid into powder having a mean particle size of no greater than 500 μm, and a step of chlorinating the powder (for claims 1-6 and 20) and the claimed chlorinated polyolefin, wherein the chlorinated polyolefin is obtained by the process and has an elongation of at leat 1500% based on a tensile test; a glass transition temperature of no higher than -25°C (for claims 7-19).

Aystetten et al. disclose a process to chlorinate a polyethylene having an ultimate melting point of 136°C, comprising subjecting the polyethylene to a heat treatment by heating in a nitrogen to about 122°C and keeping at that temperature for 15 minutes; cooling down the polyethylene; and chlorinating the resulting polyethylene with chlorine at a temperature gradually raised to 137°C (Example 1). However, Aystetten et al. do not teach or fairly suggest the claimed process, wherein the process comprises a step of melting, kneading, and then molding a polyolefin to a solid, a step of pulverizing the solid into powder having a mean particle size of no greater than 500 μm, and a step of chlorinating the powder (for claims 1-6 and 20) and the claimed chlorinated polyolefin, wherein the chlorinated polyolefin is obtained by the process and has an elongation of

at least 1500% based on a tensile test; a glass transition temperature of no higher than -25°C (for claims 7-19).

Rifi discloses a process to modify ethylene polymers by reacting granular ethylene polymers having a density of about 0.87 to about 0.92 g/ccwith a gaseous chlorinating agent to produce the chlorinated polymers, wherein the particle size of the granular ethylene is exemplified to be 500 or 400 microns (abstract; col. 4, line 14 [A or B]). However, Rifi does not teach or fairly suggest the claimed process, wherein the process comprises a step of melting, kneading, and then molding a polyolefin to a solid, a step of pulverizing the solid into powder having a mean particle size of no greater than 500 μm, and a step of chlorinating the powder (for claims 1-6 and 20) and the claimed chlorinated polyolefin, wherein the chlorinated polyolefin is obtained by the process and has an elongation of at least 1500% based on a tensile test; a glass transition temperature of no higher than -25°C (for claims 7-19).

Benedikt et al. disclose a process for chlorination of powdered polyethylene with chlorine at an initial temperature from about 20°C to about 70°C and raising the temperature of the reaction to at least about the crystalline melting point of the polyethylene and continuing the reaction until the polyethylene contains greater than 25-45 wt% bound chlorine, wherein the polyethylene can be low density, high density, linear, or branched and has a density of from about 0.90 to 0.97 and an average particle size of 100 microns to less than 600 microns (abstract; col. 2, lines 30-51). However, Benedikt et al. do not teach or fairly suggest the claimed process, wherein the process comprises a step of melting, kneading, and then molding a polyolefin to a solid, a step

of pulverizing the solid into powder having a mean particle size of no greater than 500 μm, and a step of chlorinating the powder (for claims 1-6 and 20) and the claimed chlorinated polyolefin, wherein the chlorinated polyolefin is obtained by the process and has an elongation of at least 1500% based on a tensile test; a glass transition temperature of no higher than -25°C (for claims 7-19).

Furthermore, the results demonstrate that the claimed process results in the chlorinated polyolefin (examples 1-9) having a higher flexibility at lower temperature than the chlorinated polyolefin (comparative examples 1-4) obtained otherwise.

example	elongation (%)	T_g (°C)
1	≥ 1600	-25
2	≥ 1600	-26
3	≥ 1600	-25
4	≥ 1600	-26
5	≥ 1600	-25
6	≥ 1600	-27
7	≥ 1600	-25
8	≥ 1600	-25
9	≥ 1600	-26
comparative example		
1	1200	-22
2	1000	-20
3	1200	-23
4	1100	-20

In light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.

LING-SUI CHOI
PRIMARY EXAMINER

November 10, 2007